Chapter 6
IHFR

6-1. System Description

IHFR, like SINCGARS, is a modular design radio. The components that make up the different radio configurations are similar from set to set. Fielding for IHFR is different from SINCGARS in that IHFR is a replacement system and a new capability system. It replaces the stand-alone AN/GRC-106 and the AN/PRC-70/74. It will also be used in combat, CS, and CSS Armywide. When using IHFR, all transmissions should be secured with an approved cryptographic system.

6-2. Components

a. The primary component of IHFR sets is the RT-1209. Figure 6-1 shows the RT and the amplifier/coupler described below. It is an SSB radio that can operate in either the upper or lower sideband. It operates over the frequency range from 2 to 30 MHz in 100 Hz increments. This makes it compatible with all currently fielded US and allied SSB radio systems. However, it is only compatible when operating in the upper sideband mode. IHFR is not directly compatible with older generation AM double sideband (DSB) radios. An experienced AM-DSB radio operator can receive the SSB signal using special procedures specified in FM 24-18. IHFR accepts input of voice and data rates up to 2,400 bps when used with appropriate data modems. The RT can be set for RECEIVE ONLY to prevent unintentional transmissions during radio listening silence.

b. The amplifier/coupler AM-6874 provides final output amplification and antenna matching. The amplifier section boosts output from the RT-1209 up to 20 watts peak. The coupler circuit automatically tunes the antenna to the radio's operating frequency. In most cases, the tuning takes 3 seconds or less. The coupler device provides audio signals verifying the tuning is complete. The amplifier/coupler is part of radio sets AN/PRC-104 and AN/GRC-213.

c. The amplifier-power supply AM-7152 provides the power to operate an external speaker and the required voltage sources to power the radio and accessories. Figure 6-2 shows the AM-7152 as part of radio set AN/GRC-213.

d. The following devices are components of the radio set AN/GRC-193A (Figure 6-3). The items are the same in the A and B versions.

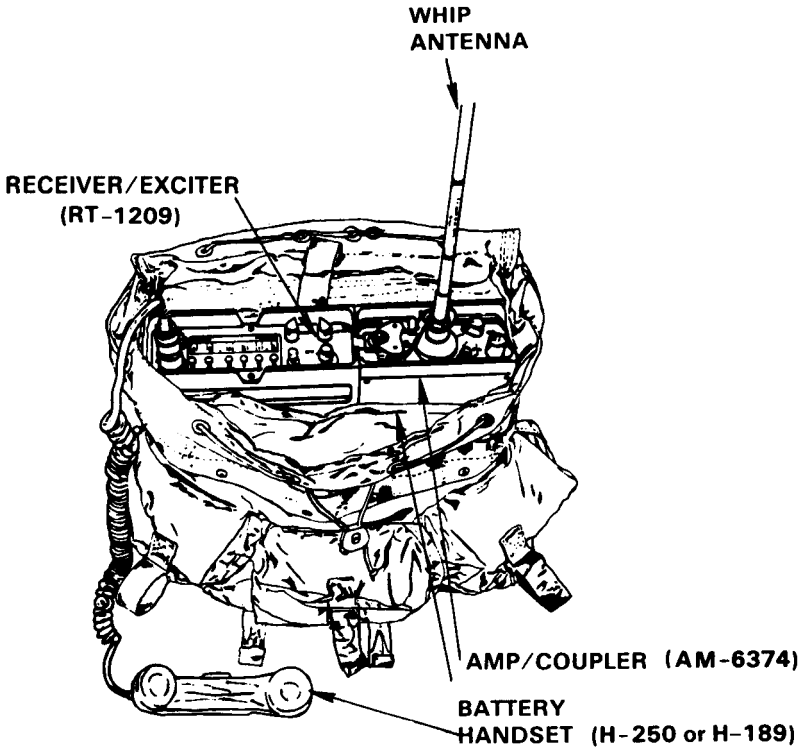

Figure 6-1. RT-1209 and amplifier/coupler.

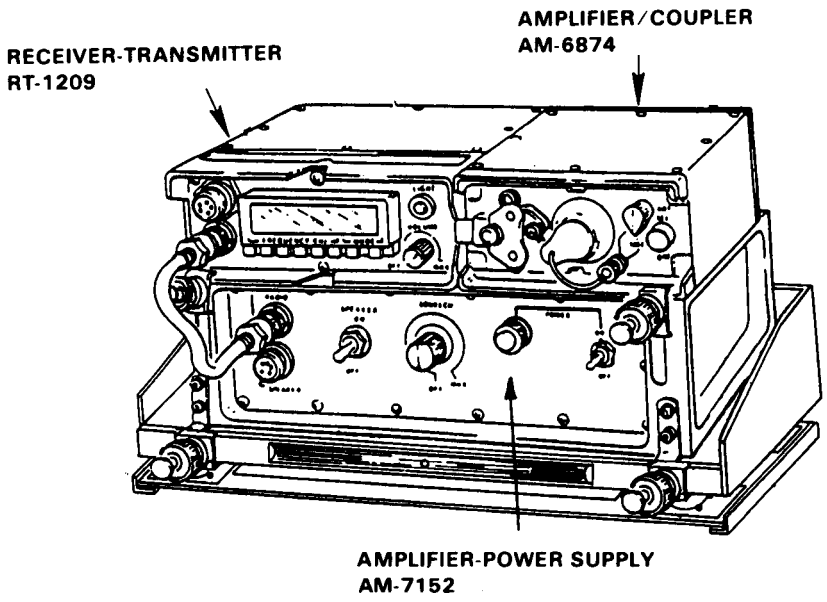

Figure 6-2. Radio set AN/GRC-213.

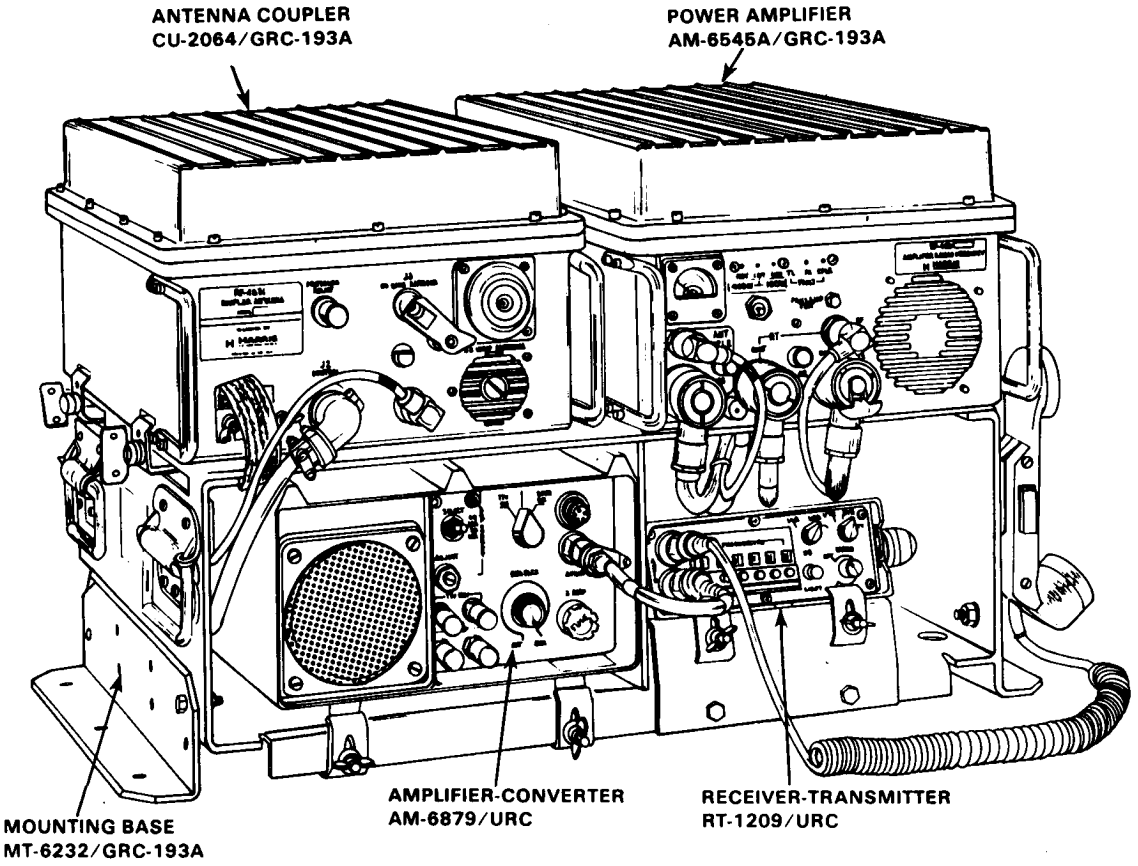

Figure 6-3. Radio set AN/GRC-193A.

(1) Antenna coupler CU-2064 is part of the high-power model. It provides the same function as the coupler section of the amplifier/coupler in the low- power version. The coupler automatically matches the impedance of the vehicular whip antenna.

(2) Power amplifier AM-6545A provides final output power. Output power is selectable between 100 and 400 watts. It provides visual indication of the radio's internal functioning, whether warming up, transmitting, or tuning.

(3) Amplifier-converter AM-6879 performs two functions. It amplifies the audio signal output to the external speaker, and is the modulator-demodulator for teletype signals. It accepts either 20 or 60 milliamp circuits making it compatible with mechanical and automatic teletype machines.

e. There are three mounting bases associated with IHFR--one for the AN/GRC-213 and two for the AN/GRC-193A. The mounts provide a secure location for installation in tactical wheel and track vehicles.

f. The three antennas associated with the IHFR systems are the whip antenna (both manpack and vehicle mounted), the AN/GRA-50 doublet antenna, and the AS-2259 near vertical incident skywave antenna. The antennas are only mentioned here as part of the overall radio system. FM 24-18 and FM 24-19 describe the radiation patterns and uses for the various antennas.

6-3. System Configurations

a. The IHFR system is designed around three versions. Of the three versions, one is manpack, one is a low-power set adaptable for manpack or vehicular use, and one is a high-power set strictly for vehicular installations. As stated above, the RT-1209 is a common component of all three radio sets. The remaining components of each set come from the devices listed above.

b. Manpack radio AN/PRC-104A (Figure 6-1) consists of the RT, amplifier/coupler AM-6874, antennas, and handsets. It replaces the manpack radio AN/PRC-70/74. The AN/PRC-104A provides 280,000 tunable channels and has automatic antenna tuning.

c. Low-power vehicular/manpack radio AN/GRC-213 (Figure 6-2) is used in a new role. It provides the tactical commander with an HF capability. It consists of the AN/PRC-104A radio with a vehicle mount and amplifier-power supply AM-7152. The three antennas described above are also components of the set. Neither the AN/GRC-213 nor the AN/PRC-104A should be used for data transmissions exceeding 1 minute in a 10 minute time frame. The low-power IHFR radio has a maximum key down time of 1 minute (ratio of 1 to 10, 1 minute transmission, 9 minutes receive). Any key down time more than 1 minute can damage the radio.

d. The high-power vehicle radio AN/GRC-193A (Figure 6-3) replaces the stand-alone AN/GRC-106.

6-4. Ancillary and Secure Equipment

a. The remote associated with IHFR is the AN/GRA-39C. IHFR can be used with the AN/VIC-l vehicular intercommunications remote control with the VHF radios.

b. The KY-65 and the KG-84/KW-7 are the only encryption devices available for securing IHFR voice and data. The advanced narrowband digital voice terminal (ANDVT) MINTERM (Figure 6-4) is the new system for securing voice and data transmissions. The MINTERM replaces the KY-65 currently used with IHFR.

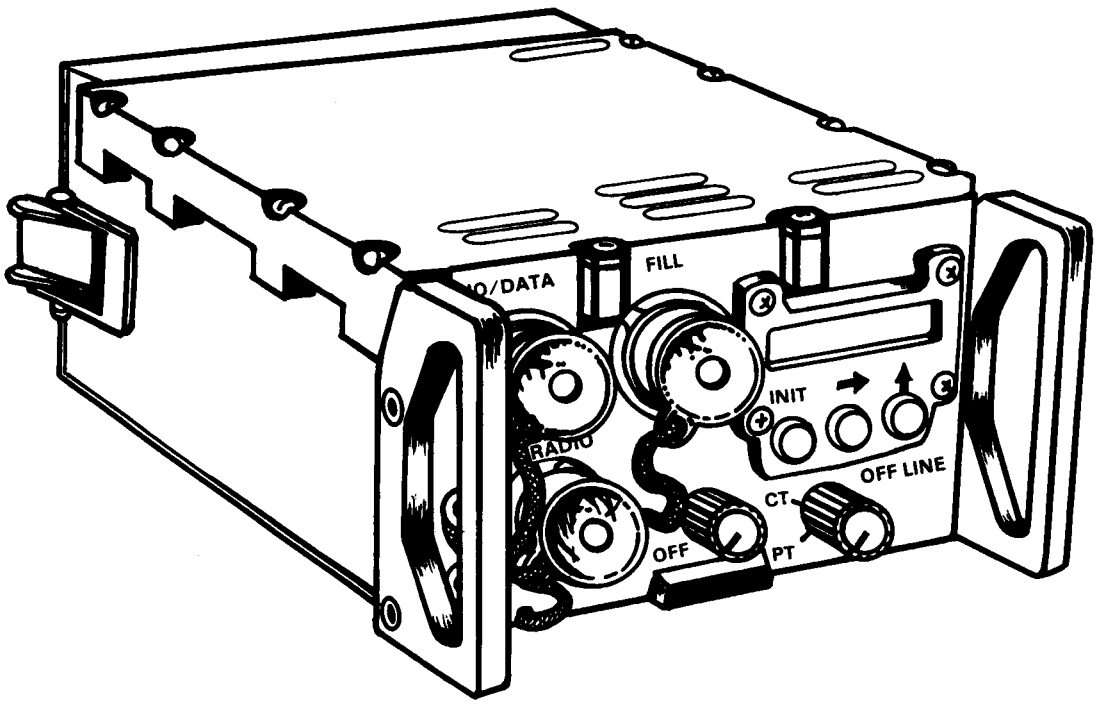

Figure 6-4. ANDVT MINTERM (KY-99).